UNIVERSITY OF CALIFORNIA.

AGRICULTURAL EXPERIMENT STATION.

BERKELEY, CAL.

E. W. HILGARD, DIRECTOR. BULLETIN No. 109.

DISTRIBUTION OF SEEDS AND PLANTS.

NOVEMBER, 1895.

DISTRIBUTION OF SEEDS AND PLANTS.

By E. J. Wickson, Associate Professor of Agriculture.

The branch of the work of our station which relates to the introduction and trial of economic plants from all parts of the world, is steadily advancing, and commanding wider public interest. Our plan of distributing to volunteer experimenters, plants or seeds of those growths which seem most promising after trial upon the grounds of our own stations, seems to commend itself more and more each year to the people of the State. The extent to which this work has attained is clearly shown in the following brief summary of the materials distributed and the applicants supplied during the last ten years:

Ounces of Seeds Distributed, 1886-94.

Cereals	17,016
Fiber plants	2,580
Forage plants	12,887
Vegetables	7,316
Trees	2,139
Miscellaneous	2,292

Numbers of Plants and Scions, same period.

Trees of 30 kinds	6,150
Fiber plants	1,530
Forage plants (roots)	14,770
Grapes, figs, and olives (cuttings and rooted)	18,084
Mulberries and osier willows (cuttings and rooted)	13,105
Miscellaneous	3,618

The increasing popular interest in the distribution is also seen in the fact that 925 applicants were supplied with seeds and plants last year, as compared with 410 in the preceding year. Material was sent last year to applicants at 382 post offices in 53 counties of California.

AIMS AND METHODS OF DISTRIBUTION.

To reduce as much as practicable the vast amount of correspondence which is entailed upon the station by the distribution, we desire that the following points should be carefully considered by all applicants:

First—Do not apply for seeds or plants unless you will report results of trial from time to time, until the success or failure of each growth is demonstrated.

Second—Do not apply for things not mentioned in *this* bulletin. We cannot usually supply things previously offered for distribution. Do not apply for common garden seeds, fruit trees, or ornamentals, which can be purchased at seed stores or nurseries. We cannot supply them.

Third—Do not make a general request "for anything which will do in this locality." Apply specifically for what interests you, or may prove of value to you.

Fourth—We cannot undertake distribution to citizens of other States, except in exchange for something which we desire for trial.

Fifth—We require the applicant to pay a small amount for each thing received, partly to bear the cost of distribution, but chiefly as a guaranty that he has not merely an idle desire for what can be had for nothing, but intends to make trial for a definite end and will report results to us.

TERMS.—For the reasons above stated applicants are requested to send the amount specified in connection with each description below to meet the expenses of packing and postage. If they desire seeds sent by express applicants need not send the amounts specified for postage, *but all orders for* SEEDS *by express* must be accompanied by a remittance of one third of the amount specified, to pay for packing. *Express charges are paid by the recipient.* Applications may be made for one or more kinds of seeds, *but an applicant should not order more than one package of a kind.* If the supply of any kind of seed becomes exhausted, the money will be returned, unless a second choice is mentioned by the sender. Postal notes are requested instead of stamps whenever practicable. Any surplus left after filling orders will, as far as possible, be returned to the senders, deducting letter postage.

PLANTS FOR GREEN-MANURING.

Green-manuring is intended to return to the land the entire mass of one crop, for the benefit of one or more succeeding ones. In doing this, we expend in seed and cultivation a certain amount of money, which might have been used for the purchase of fertilizers instead; hence, it is very important that the benefits to be derived from either mode of expenditure be fully considered. If, for instance, the growing of a green-manuring crop involves the loss of one year's time and market crop, it may prove more expensive than the purchase of the fertilizer producing the same effect.

We will, first of all, then look for a crop of rapid development, which can be grown between harvest and seeding time, if possible; or, which at least will, after one cutting, still grow a sufficient mass of vegetable matter to render its turning-under a paying operation.

The next point we should consider is that the mass of vegetation to be plowed under should be as large as possible.

And finally, we should seek for plants that will not only return to the soil that which they took from it, but something more, by way of interest on the investment. It is evidently desirable that the substance of the plant used should, as far as possible, be taken from a soil layer different from that which is specially drawn upon by the coming crop. The grains and true grasses, with their shallow roots, draw chiefly upon the surface soil; hence, the green crop intended for their benefit should in the main be made to draw upon the subsoil by the choice of deep-rooted plants. Rye and other cereals, and true grasses, in their decay, give to the soil little or nothing that was not already in the surface soil.

While this is true of the grasses, properly so called, it is quite otherwise with the clovers and their related plants, such as peas, beans, vetches, etc. These plants not only have deep roots, by which they bring up from the subsoil plant-food beyond the reach of cereal crops,

but also take from the air, indirectly, large amounts of that most costly of all plant-foods, nitrogen, by means of little excrescences developed on their roots. From this cause they have, from remote times down to the present, been considered and used as soil improvers; hence, it is among these "legumes" that we should primarily seek for crops suitable for green-manuring. Red clover being unavailable in California, and alfalfa difficult to handle for the purpose, we have long sought for some other suitable crop fulfilling the above conditions. Another important requirement is that the plant chosen should make a free growth during the winter, so that a good amount of green stuff can be ready for plowing under early in the spring, and the ground brought into good surface tilth to conserve moisture.

Viewing these local requirements, the two plants first mentioned below seem to be promising:

Snail Clover (*Medicago turbinata*).—This plant is a native of southwestern Spain, and has shown value as a winter forage plant in this State. It is closely related to the "burr clover," but it has a larger seed-pod, which is smooth and more abundantly produced, and therefore the plant is superior as a dry forage plant for stock. The green growth of the snail clover resembles that of burr clover, but with us it is much ranker. It starts from the seed as soon as the earth is moistened by the fall rains, and makes a strong growth during the winter and spring, drying up as soon as its vast crop of seed-pods ripens early in the summer. By sowing upon orchard ground, plowed as early as practicable in the fall, it should make a dense mat of foliage by the time of the spring plowing. It seeds so freely that by allowing a small area to go unplowed in the spring, seed enough can be secured for covering a considerable area of orchard. On the station grounds in Berkeley we sowed 12½ pounds of seed on about one quarter of an acre, and secured 400 pounds of seed-pods. The seed-pods are so large that they can be easily gathered from the surface of the ground after the plant has dried up. In its winter growth, therefore, and the ease with which the seed can be produced, the snail clover offers many points of promise as a green-manure plant. We advise that experimenters devote this year to observation of the winter growth of the plant in their localities, and allow the plant to stand until maturity to get seed for another year's larger sowing and plowing under. Soak the pods, and sow rather thinly broadcast as early as the ground can be put in shape, and cover by raking or harrowing. Seed in 12-ounce parcels, 10 cents each by mail.

Square Pod Pea (*Lotus tetragonolobus*).—We offered this plant for experiment in green-manuring last year, but were unable to supply the seed, because our orders placed in Europe could not be filled. This year we have a supply of seed of our own growing. From our observation of the growth of the plant another season, we are less confident of its value for the purpose contemplated. Its roots, by their thick incrustation of tubercles, show that the plant is very active in its assimilation of atmospheric nitrogen, but more observation is needed on its winter growth to determine its availability for green-manuring in different portions of the State. It is noticeably less hardy than snail clover, and more sensitive to drought. The seed should be sown thinly broadcast on newly turned soil, and raked in. Sown in January, it should

Plate I. Snail Clover. Plant reduced, as shown in scale of inches; seed-pod natural size.

be ready to be plowed under in May. In some places earlier sowing and plowing under might be better. We hope to determine these points by the aid of our correspondents this winter. Seed in packets, 5 cents each.

Crimson Clover (*Trifolium incarnatum*).—The winter growth of this plant, according to our observation and reports made to us, is not satisfactory, consequently, it does not serve for green-manuring here as well as it does in the East, where it can be plowed under in midsummer. It makes a splendid growth in most parts of California in May and June, but it is then too late for plowing in. We are, however, constantly asked for the seed, and can furnish it to those who desire to establish the facts for themselves. Seed in 4-ounce packets, 5 cents each, by mail postpaid.

DRY LAND GRASSES AND FORAGE PLANTS.

We find that through the visits of stockmen to our experiment grounds, and the exhibition of our collection of forage plants at meetings of farmers and dairymen, there has arisen renewed demand for seeds of plants which we have commended for dry lands. We do not present any of these plants as fully satisfactory on dry lands nor for use where, by irrigation or occurrence of naturally moist land, better plants, such as alfalfa, etc., can be grown. We have found that plants which best endure arid conditions are, for the most part, coarse plants, which are chiefly valuable because they accept conditions which finer plants reject, but even they have their limits of endurance, for heat and drought may be so extreme and protracted that they fail. We make this explanation because some of our correspondents desire to substitute these for better plants which their soil and moisture conditions favor, and others expect them to succeed in situations actually desert. For neither uses do we commend the plants we shall name below, but we can assure our correspondents that of the forage plants we have grown experimentally and distributed, the following are the most satisfactory for dry lands:

True Grasses.—The following are true grasses (*gramineæ*). The seeds should be sown in places where their growth can be conveniently watched, so that each grower can determine for himself which ones should be largely sown the following year. By collecting seed from a small plot a large area can soon be secured:

1. Tall Oat grass (*Arrhenatherum avenaceum*).
2. Awnless Brome grass (*Bromus inermis*).
3. Schrader's Brome grass (*Bromus unioloides*).
4. Japanese Wheat grass (*Agropyrum japonicum*).
5. Many-flowered Millet grass (*Milium multiflorum*).
6. Hairy-flowered Paspalum (*Paspalum dilatatum*).
7. Texas Blue grass (*Poa arachnifera*).

Of any of the first six named, we will send seed at 5 cents each per package.

No. 7 grows best from the *roots*, of which we send a package for 10 cents.

Flat Pea (*Lathyrus sylvestris*).—Many reports from California growers indicate that this plant may prove of much value in some parts of the State. It does not succeed in the presence of the greatest heat and drought, but it maintains heavy growth with very little moisture. The flat pea is a perennial legume having much the style of growth of the "everlasting pea." It forms a dense mat of haulm, or vine, which completely covers the ground, the stems reaching a length of four feet or more. In this locality it keeps green all summer without irrigation. After cutting, a second growth starts at once. Analysis of the plant made at this station (of which a copy will be sent on application) gives it high nutritive value. The plant does not seed in this locality. We furnish root-sets, which should be planted in the garden or field corner where they can be watched and protected the first year. If the growth be satisfactory, the roots can be planted here and there in waste places the following year. We will send a small package of roots postpaid for 10 cents.

Sacaline (*Polygonum saghalinense*).—This is the plant which has been so extravagantly praised in newspapers and in the catalogues of some seedsmen during the last two years. We do not approve all the claims made for it, and we do not advise its planting, except on dry, waste lands, where it may furnish good browsing for stock, which eat it readily. In good lands there is a danger of its becoming a serious pest, for it may prove difficult to eradicate. The plant is hard to start from the seed under ordinary conditions. We furnish rooted plants at 15 cents per package, postpaid.

FORAGE PLANTS FOR ALKALI SOILS.

Australian Salt Bush (*Atriplex semibaccatum*).—The past year's experience with this plant, both on our own station grounds at Tulare and on the lands of scores of those to whom we furnished seed or plants, shows that this plant has peerless adaptation for growth on soils too alkaline to support any other useful growth. So strongly are owners of alkali lands impressed with this fact that thousands of acres will be sown this winter. Enthusiastic correspondents write us that the trial and announcement of the suitability of this plant are worth more to California than all the money the University Experiment Stations have cost from their beginning. The introduction of the plant to owners of waste alkali lands is certainly one of the most striking achievements in our long-continued policy of trial and distribution of economic plants. Our Bulletin No. 105, which will be mailed to all applicants, gives observations of the growth of the plant, hints for its culture, and investigations into its food value. The engravings used herewith show its wonderful growth. Small plants set in alkali spots have attained a thick, matted growth sixteen feet in diameter in a single season. The crop, calculated on the basis of weighing the cut from a small area, should reach twenty tons of green feed, or five tons of dry, from an acre, and probably two such cuts can be made each season. Three parts of this forage, mixed with one part of common hay, is readily eaten by horses and cattle. Sheep and hogs eat the green plant freely. We desire to have it tried on alkali soils everywhere, in order that its climatic and other adaptations may be definitely determined.

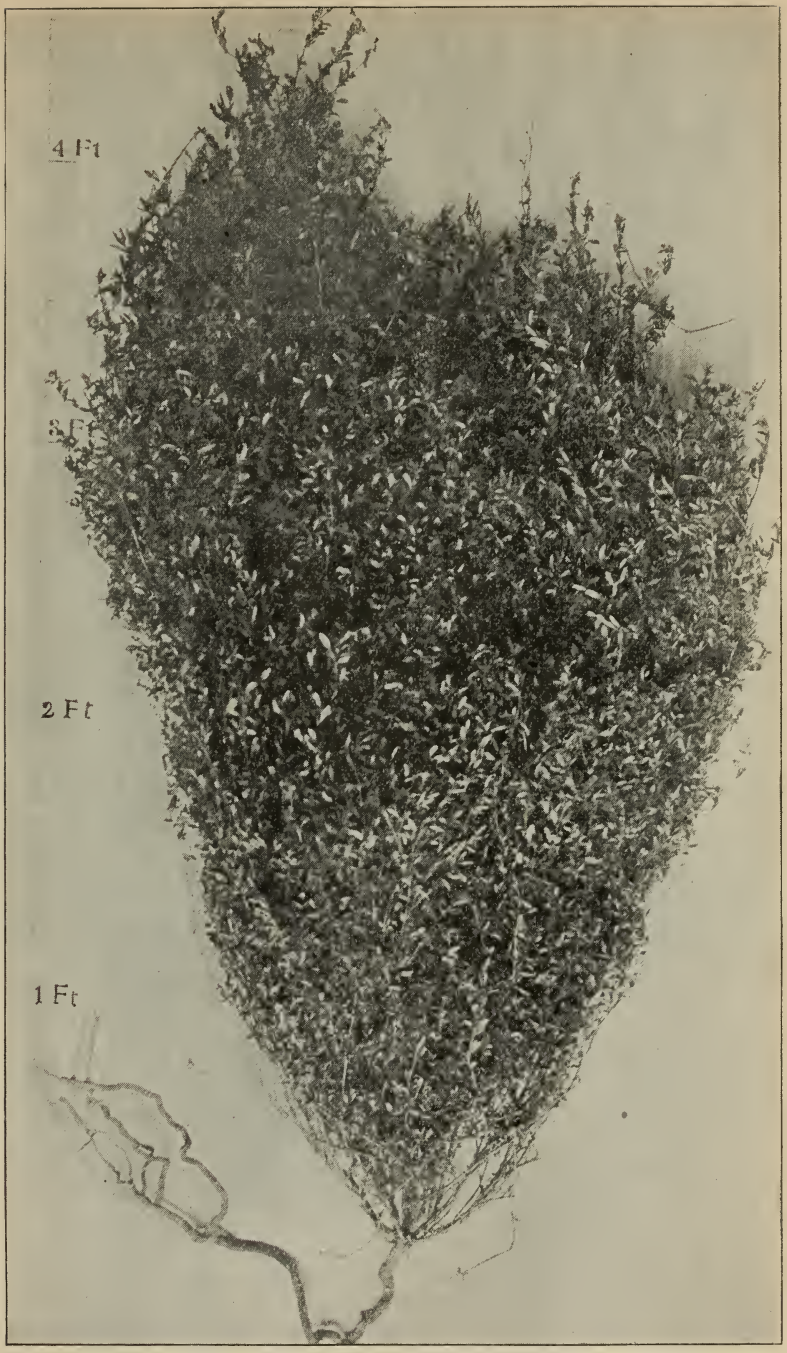

Plate II. Australian Salt Bush (*Atriplex semibaccatum*), showing 8 months' growth from one seed ; foliage gathered up to show length.

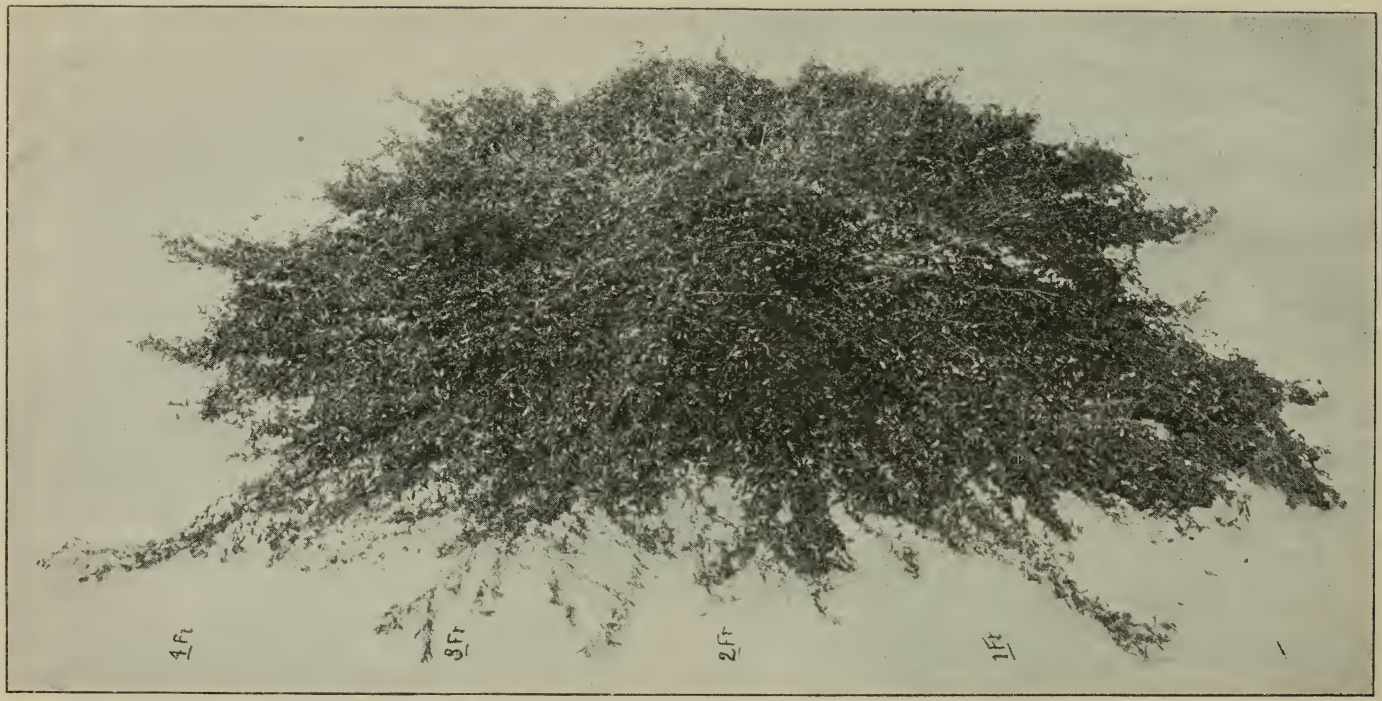

Plate III. Single Plant of Salt Bush; showing natural, circular, prostrate growth.

Plants may be grown by sowing the seed in boxes or garden bed, covering very lightly, and planting out the seedlings several feet apart, when a few inches high, on alkali spots. This is the surest way to get the plant established, although if the seed be scattered on the surface of the alkali soil before a rain, it germinates readily when the heat is adequate. When the plant once gets a hold on the soil, it covers the ground very thickly from self-sown seeds, which are produced in abundance. We send seeds at 5 cents per packet, postpaid.

Salt Bush No. 2 (*Atriplex leptocarpa*).—Since the foregoing has shown such value in this State, Baron Von Mueller has sent us seed of another salt bush, which is native to East Australia. It is reputed to withstand much drought, to be valuable as stock feed, and to produce large quantities of seed if not fed down to closely. We desire to have it tried in comparison with the *semibaccatum*. It has a somewhat larger leaf, and may show other differences in feature or behavior. We have only small plants in pots for distribution this year. We will send three in one package for 15 cents, postpaid.

Modiola (*Modiola decumbens*).—This plant, which is a native of Chile, has been observed growing freely on alkali lands in Kern County. How the plant was introduced is not known. Last winter, Mr. A. B. Leckenby, of Bakersfield, sent specimens to us for identification, with the statement that it grows luxuriantly on alkali land, without irrigation; that sheep eat it closely; that it seems as well fitted for horse feed as alfalfa, and that cows eat it in preference to alfalfa, and improve in flow of milk. Analysis of the plant in the station laboratory shows that it is almost as rich in flesh-forming ingredients as alfalfa; in this respect it is superior to the salt bushes. Judging from the Kern County observations, this plant may be valuable on dry and waste places, even when strongly alkaline; but it *must be introduced with caution*, because it has a habit of rooting from its prostrate stems, and therefore will be very difficult to eradicate. In this respect it is very different from the salt bushes. To those who desire to try the modiola in places which are waste and remote from cultivated lands, we will send small packets of seed at 2 cents each.

TREES AND SHRUBS.

Paper Mulberry Tree (*Broussonetia papyrifera*).—A tree indigenous to the east coast of Asia and the Pacific islands. It is not a "mulberry" (*Morus*), nor can its leaves be used for silk worms, though they suggest the mulberry in form. The tree sometimes attains a height of 40 feet, and the bark was formerly used in large quantities to make the strong paper, or paper-cloth, which was used by the Pacific Islanders for clothing before the introduction of European cloths. It still supplies the chief material for the strong Japanese paper. The tree is offered for trial as an ornamental, and as interesting also to those who like to make collections of plants with unique economic history. For the making of cloth the plant was grown like an osier willow, and the tender bark stripped from the shoots. For ornamental purposes it should be trained to tree form. In moist ground it is liable to sucker abundantly from the roots. It will probably prove hardy in all except the mountain region of Cali-

fornia. We will send a package of three small plants by mail for 25 cents, postpaid.

English Oak (*Quercus robur*).—This is exceedingly satisfactory as a rapid-growing hard wood and shade tree in the coast region of California at least, and deserves wide planting. As there is some difficulty in transplanting, we will send acorns to those who desire to start trees in permanent place. Half-pound packages of fresh California-grown acorns, 8 cents each by mail, postpaid.

Guavas.—We have grown five varieties of guavas from seed received from the Botanic Gardens at Lucknow, India. These are among the best sorts of that region, and we offer them for trial, in comparison with varieties already grown in this State. They are as follows:

No. 1. Large, white-fleshed.
No. 2. Smooth, green.
No. 3. Small, red-fleshed.
No. 4. Allahabad.
No. 5. Large, red-fleshed.

We will send packages containing one plant of each variety for 40 cents, postpaid.

TOBACCO.

The increasing interest in tobacco, through its advocacy as a possible California product, induced us to grow on our station grounds in Berkeley a large collection of the leading varieties, for the purpose of obtaining seed for distribution, and to make experiments in curing. This collection, during its growth, attracted wide attention, and some very creditable samples of leaf were produced, though the local climate is not very well adapted to the crop. The hints which we can give to experimenters for the growth and handling of the crop will be published on a separate sheet, and sent to all who desire it. The varieties which we offer for trial are as follows:

Cigar Varieties.

1. Sumatra.
2. Zummer's Spanish.
3. Connecticut Seed Leaf.
4. Harby (Turkish).
5. Pumelly.
6. Landreth.
7. Imported Havana.
8. Comstock Spanish.
9. Little Dutch.
10. East Hartford.
11. Vuelta de Abajo.
12. Persian Rose.
13. Persian.
14. Rano de Sumatra.
15. San Juan de los Remedios.
16. Pure Havana.
17. Partidas.
18. Litte Orinoco.
19. Fiji Orinoco.
20. Brazilian.
21. Remedios.

Plug or Smoking Tobacco Varieties.

22. Locks.
23. Conqueror.
24. Ragland's Imp. Bright.
25. Bullion.
26. Hester.
27. Imp. White Burley.
28. Yellow Pryor.
29. Granville Yellow.
30. Sweet Orinoco.
31. Ragland's I'p.Yel.Orinoco.
32. Elkerson's Yellow.
33. White Burley.
34. Flaragar.
35. Famions.

The seed will be furnished in small packets at 2 cents for each variety ordered. Use the numbers in ordering.

SUGAR CANE.

Through the courtesy of Hon. Sterling J. Morton, Secretary of Agriculture, we are enabled to offer for distribution a collection of varieties of tropical sugar cane originally obtained from the Spreckels plantations, Hawaiian Islands. This collection has been grown on Union Island, San Joaquin County, at a special sugar experiment station established by the Department of Agriculture in accordance with Congressional provisions. The trial shows that the locality is not adapted to the successful growth of tropical cane, and the station is to be closed at the end of the present season. In some other parts of the State, where a higher mean summer temperature is associated with adequate moisture, these canes can be grown as garden plants, affording sweet fiber for family chewing, and limited quantities can sometimes be sold from the city fruit stands. We do not commend the growth of cane as a commercial commodity, but in favorable localities it may be interesting and valuable in a small way. We offer the following varieties:

No. 1. Rose Bamboo.
No. 2. Big Ribbon.
No. 3. Ottamattie.
No. 4. Yellow Caledonia.
No. 5. L. Chong Pimululi.

We will send five-pound bundles of butts. They are too heavy to send by mail, and express charges must be met by recipients. Our charge for packing is 25 cents for one variety, and 10 cents additional for each additional variety selected. The butts should be laid flat when planted, and covered with about three inches of light soil.

TABLE GRAPES FROM PERSIA.

We were unable to supply all applicants for these grapes last year, and have consequently continued their propagation. The grapes of the table lands of Persia have won praise from all travelers who have eaten them. These vines are of the *Vitis vinifera*, but the fruit has quite a distinctive character when compared with the varieties chiefly grown in the west of Europe. Professor H. E. Van Deman, ex-Pomologist of the Department of Agriculture, secured, through the kindly aid of Hon. E. Spencer Pratt, ex-Minister at Teheran, an importation of the best Persian varieties. These vines were in part entrusted to this station. Those varieties which we have fruited ripen very early, about with the Sweetwater, and as they are much firmer fleshed and tougher skinned than that variety, they may prove of high value for early shipping. The berries of the varieties we have fruited thus far are of large size, long-oval form, and good quality. We offer the following varieties; the descriptions are imperfect, as some have not yet fruited:

1. *Paykaynee Razukee:* Bright red, large, long, few seeds.
2. *Dizmar:* Light yellow, very sweet, long tapering.
3. *Khallillee:* Said to be the earliest in Persia.
4. *Askaree:* Widely grown in Persia and used both for table and drying; black, resembling Cornichon, but considerably earlier.

5. *Rish Baba:* Also a leading variety in the Orient for table and drying; and said to keep until spring.
6. *Hutab:* A large, sweet grape.
7. *Shiraz:* Named for one of the most important grape regions of Persia, where it is a leading sort.
8. *Alhakahee:* Red, said to be suited for long keeping.
9. *Chavooshee:* Green, a rare variety in Persia.
10. *White Shahanee:* Large, oblong, light color.
11. *Black Shahanee:* Presumably like the preceding, except in color.
12. *Unnamed Varieties:* We have eight varieties, which, in the importation, were designated only by numerals. It is impossible to ascertain their names. They are presumably as desirable as the others. After fruiting it may be possible to name them if good Persian descriptions can be obtained. If not, they may be given local names.

We will send one vine of each kind at the rate of 5 cents for each variety ordered, by mail, postpaid.

GRAINS.

Hackett's Australian Wheat.—A fine variety sent us by E. W. Hackett, of Adelaide, South Australia. It proves with us a very strong growing and prolific sort. Seed in 1-lb. sacks, 15 cents each by mail.

Nepaul Barley.—We distributed seed of this valuable barley eight or ten years ago. Since then it has been extensively tested at the experiment stations, particularly in the San Joaquin Valley, and its value for hay is well ascertained. It is a beardless barley, with very heavy heads for the type, yielding a large amount of hay, and possessing the further advantage that the leaves remain green late, so that it can be cut for hay when the grain is more mature than in ordinary varieties. It is difficult to obtain clean seed. That which we shall send was sown on clean ground, and the heads were cut by hand. Those receiving this seed should give it a little extra attention, on clean land, until seed enough is obtained to sow a large field. Seed, in 1-lb. sacks, 15 cents each by mail, postpaid.

Seed and Fiber Flaxes.—As the growth of flax is being urged upon the attention of our farmers by the oil-makers, who are dependent upon imported seed for their raw material, we resume our offer of seeds to those who desire to experiment. The best variety *for seed* production is that known as Californian; for fiber and seed combined, we offer four varieties of the best European fiber flaxes, which attain about twice the length of stem of the variety grown for seed in this State. The whole list is as follows: No. 1, White-flowering French; No. 2, Royal of Germany; No. 3, Russian; No. 4, Yellow-seeded; No. 5, Californian. Flax is hardy, and withstands ordinary California winter frosts. It should be sown early; at about the time cereals are sown, and the same precautions should be taken to kill early growth of weeds, just as it is done for wheat sowing. The flax will do better if sown in wide drills and cultivated, but will make good returns by ordinary drill sowing, or even if sown broadcast. Care must be taken not to cover the seed too

deeply. We send seed in 1-lb. sacks, 15 cents for each variety, by mail, postpaid.

Buckwheats.—We have a collection of five varieties, as follows: No. 1, Californian; No. 2, Asiatic; No. 3, Chinese; No. 4, Marginatum; No. 5, Japanese. These were obtained from different sources, and have distinguishing varietal characters. Nos. 2, 3, and 5 are best adapted for bee pasture, because of long blooming season. For the same reason they are less satisfactory to handle as a seed crop. We send seed in 1-lb. sacks, 15 cents for each variety, by mail, postpaid.

SEEDS FOR THE GARDEN.

Ceylon Pea.—This garden pea came to us without a local name, nor have we yet been able to ascertain it. Since our first distribution of the seed, it has been commended by our correspondents as having special value as a late pea for the table, and for canning. It grows notably well both in the interior and on the coast to the southern limit of the State. It produces very large pods, and is very prolific in bearing. From our trial plot 24x34 feet, we harvested 52 pounds of dry seed; equivalent to 2,775 pounds per acre. The variety seems very hardy. Dr. Goldmann, of the Santa Cruz Mountains, reports that he had green peas on December 31st, and bid fair to have them all winter. We send the seed in 4-ounce packages at 5 cents, postpaid.

New Zealand Spinach (*Tetragonia expansa*).—This is another plant previously distributed from this station, which should be much more widely grown. It is described by Von Mueller as a good culinary herb, and as useful for restraining drifting sands; growing even during severest heat and drought. Our correspondents speak of it in the highest terms as a table vegetable. Mr. Robert Hastie, of Contra Costa County, writes: "It grows all summer in very dry land and holds a beautiful dark green until frost comes, and the growth starts again the next year from the root. As an ornamental plant where water is scarce, and for the table, it has no superior." Seed, 5 cents per package, postpaid.

Orach, or Mountain Spinach (*Atriplex hortensis*).—A tall, hardy annual, native of Tartary, largely grown in France both as a vegetable and as an ornamental plant for high borders, etc. The seed came from Kabylia, and is a giant variety of orach, highly commended by the Director of the Botanic Garden at Algiers, Mustafa. The seed was donated by Dr. F. Franceschi, of Santa Barbara. We have found it a very free grower, and, judging by its success in the region whence the seed came, it should be satisfactory in the interior of California. It seems to us much inferior to the New Zealand spinach, but is worth trying to better determine its value. Seed in packages, 3 cents each, by mail, postpaid.

Melde's Perennial Bean.—A handsome, large, white bean, with a perennial root, from which climbing runners start each year. Seed, 3 cents per package.

Irvine's Hybrid Perennial Bean. — Originated on the station grounds and believed to be a cross between the Painted Lady and the Lima. It is larger than Meldo's bean, plump, pure white. Seed, 3 cents per package.

Rose Poppy.—A very striking variety in form and color, which justifies the selection of name for it. It is the result of continuous selection by Mr. E. L. Horton, Jr., of East Steamburg, N. Y., to whom we are indebted for the seed. It is certainly a very valuable acquisition for the garden of annuals. Packet by mail, 3 cents, postpaid.

Application for seeds and plants should be made as soon as this announcement is received. We are unable to continue distribution throughout the year.

Address,

E. J. WICKSON,
Berkeley, Cal.

Berkeley, November, 1895.